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EXAMINER

LAMBRECHT, CHRISTOPHER M

ART UNIT

PAPER NUMBER

2611

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Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/755,970

Applicant(s)

SHALVI ET AL.

Examiner

Christopher M. Lambrecht

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 10 December 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3,5,7 and 28-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,5,7 and 28-33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Response to Arguments*

1. Applicant's arguments with respect to claims 1-, 5, 7, and 28-33 have been considered but are moot in view of the new ground(s) of rejection.

As submitted by Applicant, the amended claims now require modulating first and second digital data streams and then combining these first and second streams (Applicant's remarks, pg. 7, ¶4).

Applicant asserts that the Ahmed reference fails to teach or suggest "combining of first and second sequences of digital samples, each corresponding to a modulated digital data stream signal, into a combined digital data stream signal that is then converted to analog and upshifted, as required by claim 1 (Applicant's remarks, pg. 8, ¶1)." Examiner respectfully disagrees. In particular, Ahmed specifically discloses that in addition to digitized data  $Z_i[nT]$  being provided to converter 710 for subsequent combining, digital-to-analog conversion, and upshifting, digitally *modulated* data  $Q_i[nT]$  of digital video channels can similarly be provided to converter 710 for subsequent combining, digital-to-analog conversion, and upshifting (Ahmed, col. 13, ll. 5-10). In this embodiment, modulating said first and second data streams occurs prior to combining, as presented in Applicant's amended claims.

Rejections based on the above interpretation of the Ahmed reference are set forth below.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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3. Claims 1, 7, 28-33 are rejected under 35 U.S.C. 102(e) as being anticipated by Ahmed (Ahmed et al., US006519773B1).

With regard to claim 1, Ahmed discloses a method of data transmission over a cable television network (fig. 1B, col. 4, ll. 66-67) between a cable modem termination system headend (106, fig. 1B, where the network services a cable modem 142, it inherently comprises a CMTS) and consumer premises equipment (134-148, fig. 1B), comprising:

modulating a first digital data stream signal (first digital video channel) associated with a first cable television channel into a first sequence of digital samples ( $Q_1[nT]$ , fig. 7) corresponding to the modulated first digital data stream signal (provided to converter 710 and represented by  $Z_1[nT]$  as shown in fig. 9, col. 13, ll. 8-10);

modulating a second digital data stream signal (second digital video channel) associated with a second cable television channel into a second sequence of digital samples ( $Q_2[nT]$ ) corresponding to the modulated second digital data stream signal (provided to converter 710 and represented by  $Z_2[nT]$  as shown in fig. 9, col. 13, ll. 8-10) (hereinafter,  $Z_i[nT]$  notation will represent digitally modulated data signals  $Q_i[nT]$  shown in fig. 7 when referring to fig. 9);

then combining the first and second sequences of digital samples ( $Z_1[nT]$ ,  $Z_2[nT]$ ) to create a first combined digital data stream signal ( $J_1[nT]$ , combined by digital frequency modulator block 906A, col. 13, ll. 16-22);

converting the first combined digital data stream signal to a modulated first analog signal (col. 13, ll. 20-25), the first analog signal having a central frequency (where an analog signal occupying a given

bandwidth inherently comprises a center frequency, i.e.,  $f_{center} = \frac{f_{upper} + f_{lower}}{2}$ , where  $f_{upper}$  and  $f_{lower}$

designate the maximum and minimum frequencies of the band occupied by the analog signal, respectively); and

up-shifting (at up-converter 912A, col. 13, ll. 25-27) the central frequency of the first analog signal to create a cable network transmittable analog signal having a frequency suited for transmission along a cable network transmission medium (col. 13, ll. 58-63).

As for claim 7, Ahmed discloses the method according to claim 1, further comprising transmitting the up-shifted first analog signal in a downstream direction from the headend to the consumer premises equipment (col. 13, ll. 58-63) using a bandwidth wider than the bandwidth of the first or second channels alone (where transmitting a plurality of channels (e.g., 6 MHz wide analog channels, col. 8, ll. 51-52) in a combined FDM signal (col. 13, ll. 36-38) inherently uses a bandwidth wider than the bandwidth of a single channel alone).

As for claim 28, Ahmed discloses the method according to claim 7, wherein the first and second digital data stream signals ( $Z_1[nT]$ ,  $Z_2[nT]$ , subsequently labeled  $F_1[nT]$ ,  $F_2[nT]$  after anti-imaging filters 904A,B) are respectively associated with adjacent cable television network channels (983 of fig. 9B illustrates spectral diagram of output of IFFT 906, showing that input channels  $F_1[nT]$  and  $F_2[nT]$  are adjacent in the combined FDM CATV signal to be delivered to consumers, col. 13, ll. 33-39 and 58-63).

As for claim 29, Ahmed discloses the method according to claim 28, wherein the wider bandwidth corresponds to the combined bandwidths allocated for separate transmission of the adjacent television network channels (see 983 of fig. 9B: bandwidth of combined signal  $J_1$  is equal to combined bandwidths of adjacent CATV channels 1, 2, ... K).

As for claim 30, Ahmed discloses the method according to claim 1, wherein digitally combining the first and second sequences of digital samples comprises multiplexing the first and sequences of digital

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samples (at block 906A, fig. 9A, where the IFFT combines the signals using frequency division multiplexing, col. 13, ll. 33-39).

As for claim 31, Ahmed discloses the method according to claim 1, further comprising filtering the first analog signal (at low-pass filter 910A, fig. 9A) prior to upshifting (at frequency converter 912A, fig. 9A, col. 13, ll. 25-30).

As for claim 32, Ahmed discloses the method according to claim 1, wherein the first and second sequences of digital samples (embodied as first combined digital data stream) are converted from digital to analog by means of a common digital-to-analog converter (DAC 908A, fig. 9A, col. 13, ll. 20-25).

With regard to claim 33, Ahmed discloses the method of claim 1, wherein the second cable television channel is adjacent to the first cable television channel (983 of fig. 9B illustrates spectral diagram of output of IFFT 906, showing that input channels  $F_1[nT]$  and  $F_2[nT]$  are adjacent in the combined FDM CATV signal to be delivered to consumers, col. 13, ll. 33-39 and 58-63);

and further comprising:

transmitting the cable network transmittable analog signal in a downstream direction to the customer premises equipment along the cable network transmission medium (col. 13, ll. 60-63), using a bandwidth corresponding to a bandwidth of the combined adjacent channels (see 983 of fig. 9B, bandwidth of combined signal  $J_1$  is equal to combined bandwidths of adjacent CATV channels 1, 2, ... K).

#### *Claim Rejections - 35 USC § 103*

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2, 3, and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ahmed in view of Calderone (US006477182B2).

Regarding claim 2, Ahmed discloses the method according to claim 1, further comprising:

modulating a third digital data stream signal (third digital video channel) associated with a third cable television channel into a third sequence of digital samples ( $Q_{t+1}[nT]$ , fig. 7) corresponding to the modulated third digital data stream signal (provided to converter 710 and represented by  $Z_{k+1}[nT]$  as shown in fig. 9, col. 13, ll. 8-10);

modulating a fourth digital data stream signal (fourth digital video channel) associated with a fourth cable television channel into a fourth sequence of digital samples ( $Q_{t+2}[nT]$ , fig. 7) corresponding to the modulated fourth digital data stream signal (provided to converter 710 and represented by  $Z_{k+2}[nT]$  as shown in fig. 9, col. 13, ll. 8-10);

then combining the modulated third and fourth sequences of digital samples ( $Z_{k+1}[nT]$ ,  $Z_{k+2}[nT]$ ) to create a second combined digital data stream signal ( $J_{k+1}[nT]$ , combined by digital frequency modulator block 906B, coll. 13, ll. 16-22);

converting the second combined digital data stream signal to a modulated second analog signal (col. 13, ll. 20-25), the second analog signal having a central frequency (where an analog signal

occupying a given bandwidth inherently comprises a center frequency, i.e.,  $f_{center} = \frac{f_{upper} + f_{lower}}{2}$ ,

where  $f_{upper}$  and  $f_{lower}$  designate the maximum and minimum frequencies of the band occupied by the analog signal, respectively); and

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combining (at combiner 916) the first analog signal and the second analog signal to create a combined analog signal (col. 13, ll. 30-32) having a plurality of center frequencies (each group of channels shifted to a different designated carrier frequencies, col. 13, ll. 58-63).

Ahmed fails to disclose upshifting the first analog signal central frequency comprises upshifting the central frequencies of the combined analog signal.

In an analogous art, Calderone discloses upshifting the first analog signal (S2-1, fig. 1) central frequency comprises upshifting the central frequencies of the combined analog signal (S4, fig. 1) (where up-shifting is achieved by 1<sup>st</sup> and 2<sup>nd</sup> mixers 140 and 160 in conjunction with synthesizers 145 and 165, col. 3, ll. 10-15, 26-37, and col. 3, l. 64 – col. 4, l. 11; i.e., the center frequency of first modulated analog signal S2-1 is upshifted starting at mixer 140 in the signal path, at which point it is in combination with at least second modulated analog signal S2-2 (as combined analog signal S4); hence, upshifting the center frequency of modulated analog signal S2-1 comprises upshifting the central frequencies of the combined analog signal), for the purpose of processing a plurality of modulated IF carriers with a single up-converter (col. 5, ll. 14-17).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include in the method of Ahmed upshifting the first analog signal central frequency comprises upshifting the central frequencies of the combined analog signal, as taught by Calderone, for the purpose of processing a plurality of modulated IF carriers with a single up-converter.

As for claim 3, Ahmed and Calderone together disclose the method of claim 2, wherein digitally combining the first and second sequences of digital samples comprises multiplexing the first and second sequences of digital samples (Ahmed, at block 906A, fig. 9A, where the IFFT combines the signals using frequency division multiplexing, col. 13, ll. 33-39), and wherein digitally combining the third and fourth sequences of digital samples comprises multiplexing the third and fourth sequences of digital samples



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(Ahmed, at block 906B, fig. 9A, where the IFFT combines the signals using frequency division multiplexing, col. 13, ll. 33-39).

As for claim 5, Ahmed and Calderone together disclose the method of claim 3, further comprising filtering the first and second analog signals (Ahmed, at low-pass filters 910A and 910B, fig. 9A) prior to upshifting (Ahmed, at up-converters 912A and 912B fig. 9A, col. 13, ll. 25-30).

### *Conclusion*

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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7. The following are suggested formats for either a Certificate of Mailing or Certificate of Transmission under 37 CFR 1.8(a). The certification may be included with all correspondence concerning this application or proceeding to establish a date of mailing or transmission under 37 CFR 1.8(a). Proper use of this procedure will result in such communication being considered as timely if the established date is within the required period for reply. The Certificate should be signed by the individual actually depositing or transmitting the correspondence or by an individual who, upon information and belief, expects the correspondence to be mailed or transmitted in the normal course of business by another no later than the date indicated.

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Please refer to 37 CFR 1.6(d) and 1.8(a)(2) for filing limitations concerning facsimile transmissions and mailing, respectively.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher M. Lambrecht whose telephone number is (571) 272-7297. The examiner can normally be reached on 9:30 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher Grant can be reached on (571) 272-7294. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Christopher M Lambrecht  
Examiner  
Art Unit 2611

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